Preparing for a Blockchain Future

Blockchain technology offers tremendous potential for business, but leaders need to be aware of the challenges of implementation.
Preparing for a Blockchain Future

i  Introduction

1  How Blockchain Will Change Organizations
   By Don Tapscott and Alex Tapscott

5  Seeing Beyond the Blockchain Hype
   Christian Catalini, interviewed by Paul Michelman

8  How Blockchains Could Transform Management
   By Theodore Kinni

13  What Problems Will You Solve With Blockchain?
    By Teppo Felin and Karim Lakhani

20  Blockchain Is Changing How Media and Entertainment Companies Compete
    By Andre Dutra, Andranik Tumasjan, and Isabell M. Welpe

27  Preparing for a Blockchain Future
    By Michael Ferguson
INTRODUCTION

Blockchain technology offers businesses a secure platform, ledger, and database where buyers and sellers can store and exchange value without the help of traditional intermediaries. It could transform how businesses are organized and managed. This collection of articles from MIT Sloan Management Review examines the new world of blockchain technology.

From “How Blockchain Will Change Organizations”:

- Blockchain — the technology underlying digital currencies such as Bitcoin — will have profound effects on the nature of companies, transforming how they are funded and managed, how they create value, and how they perform basic functions such as marketing, accounting, and creating incentives that motivate people.

- Today’s business transaction intermediaries do only an adequate job. Their servers are vulnerable to crashes, fraud, and hacks. They charge fees. They monitor customer behavior and collect data, and they exclude the hundreds of millions of people who can’t qualify for bank accounts.

- A blockchain has several advantages. It is distributed — it runs on computers provided by volunteers around the world, so there is no central database to hack; it is public; and it is encrypted — collective self-interest ensures that a blockchain is safe and reliable.

- Compared with business models that rely on intermediaries, networks based on blockchain will be better suited for creating products and services and for delivering value to stakeholders.

From “Seeing Beyond the Blockchain Hype”:

- While the potential for blockchain to transform how organizations produce and capture value is very real, so are the challenges to its broad implementation.

- Research from Christian Catalini (of the MIT Sloan School of Management) and Joshua S. Gans (of the University of Toronto Rotman School of Management) offers a balanced economic analysis of blockchain and cryptocurrencies such as Bitcoin.

- In a Q&A, Catalini says that given the strong polarization about the technology and its potentials, “economic theory can be extremely helpful in these cases: You take a step back, try to ignore the noise, and focus on the basic assumptions the technology is challenging.”

- “We started by asking ourselves: What fundamental costs does blockchain reduce?” he says. “We concluded that at least two key costs will be affected: the cost of verifying the attributes of a
transaction (for example, when did it take place, who was involved, etc.) and the cost of exchanging value within a network without relying on a costly intermediary. The ability to securely record and time-stamp information on a blockchain is extremely valuable when issues arise with a transaction.

**From “How Blockchains Could Transform Management”:**

- In an excerpt from *Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World*, authors Don Tapscott and Alex Tapscott write that blockchain’s transparency will have profound effects: “There’s no walking back poor decisions, no spinning the order of events.”
- “Imagine the opportunities that arise from the ability to search the World Wide Ledger, a decentralized database of much of the world’s structured information,” they write. “Who sold which discovery to whom? At what price? Who owns this intellectual property? Who is qualified to handle this project?” In a blockchain world, the results of these queries will be “transaction histories, proven track records of individuals and enterprises, ranked perhaps by reputation score.”
- Vitalik Buterin, founder of the Ethereum blockchain, put it this way: “Blockchains will drop search costs, causing a kind of decomposition that allows you to have markets of entities that are horizontally segregated and vertically segregated. That never really existed before.”
- Search will be multidimensional. “When you search the world wide web today, you search a snapshot in time, as indexed over the last several weeks,” the Tapscotts write. “Computer theorist [Andreas] Antonopoulos called this two-dimensional search: horizontal, a wide search across the web, and vertical, a deep search of a particular website. The third dimension is sequence, to see these in the order of uploading over time.”

**From “What Problems Will You Solve With Blockchain?”:**

- Companies need to carefully consider how ledger technologies fit into their overall strategies.
- Without that lens, companies risk making large investments in initiatives that won’t create meaningful value.
- The practical questions companies should ask include the following: How will blockchain help us reach new customers? How can it improve efficiency or transparency in our supply chains? And, most important, will it enable us to do things that competitors and new entrants can’t?
- By examining what they are trying to do with blockchain, what value they want to capture with it, and which stakeholders they hope to serve, companies can use ledger technologies to solve strategic problems in a more targeted way.
From “Blockchain Is Changing How Media and Entertainment Companies Compete”:

- A study of blockchain-enabled business models in 20 startups involved in the production and distribution of various types of content — ventures in music, TV and video, publishing, social media, video games, and digital art — revealed several applications and business models that are changing how companies manage digital assets and capture revenue.

- Many companies are starting to use “smart property” to track and enforce rights for creators of digital content, including music, video, books or articles, and art. Monegraph, which provides an ownership registration service for digital art, stores intellectual property information on digital artwork and helps artists define their licensing terms and make transactions with publishers or digital-art buyers. Once ownership of an asset is recorded in the blockchain, it can be easily accessed and verified by anyone — and cannot be refuted or falsified.

- A blockchain-based startup called Yours operates a digital platform on which authors and other content creators publish their work and charge small micropayment fees of as little as a few cents per article in the form of Bitcoin Cash.

- Yours allows content creators to set their own rates for how much they will receive when someone reads or views a post. Authors and artists can even charge users for the right to comment. Compensating users on both sides represents an entirely new concept for monetizing social network activity.

From “Preparing for a Blockchain Future”:

- In a Deloitte survey of 308 senior executives at large U.S. companies, 39% of the respondents said they had little or no knowledge of blockchain technology.

- A survey of board-level, non-IT executives in the U.K. yielded similar results: About 40% said they do not fully understand the technology, and less than 10% said they believe their organizations have the skill sets to adopt it.

- Organizations need to consider three key questions when determining how to make blockchain a useful part of their business strategies: What value will we offer? How public will our blockchains be? And, what incentives will we offer to participate?

- Businesses might offer crypto tokens, or blockchain assets, as incentives for participation.
How Blockchain Will Change Organizations

What if there were an internet of value — a secure platform, ledger, or database where buyers and sellers could store and exchange value without the need for traditional intermediaries? This is what blockchain technology will offer businesses.

By Don Tapscott and Alex Tapscott

For the last century, academics and business leaders have been shaping the practice of modern management. The main theories, tenets, and behaviors have enabled managers to build corporations, which have largely been hierarchical, insular, and vertically integrated. However, we believe that the technology underlying digital currencies such as bitcoin — technology commonly known as blockchain — will have profound effects on the nature of companies: how they are funded and managed, how they create value, and how they perform basic functions such as marketing, accounting, and incentivizing people. In some cases, software will eliminate the need for many management functions.

Sound far-fetched? Let us explain. The internet vastly improved the flow of data within and between organizations, but the effect on how we do business has been more limited. That’s because the internet was designed to move information — not value — from person to person. When you email a document, photograph, or audio file, for example, you aren’t sending the original — you’re sending a copy. Anyone can copy and change it. In many cases, it’s legal and advantageous to share copies.

By contrast, if you want to expedite a business transaction, emailing money directly to someone is not an option — not only because copying money is illegal but also because you can’t be 100% certain the recipient is the person he says he is. As a result, we use intermediaries to establish trust and maintain integrity. Banks, governments, and in some cases big technology companies have the ability to confirm identities so that we can transfer assets; the intermediaries settle transactions and keep records.

For the most part, intermediaries do an adequate job, with some notable exceptions. One concern is that they use servers that are vulnerable to crashes, fraud, and hacks. Another is that they often charge fees — for example, to wire money overseas. They also monitor customer behavior and collect data, and they exclude the hundreds of millions of people who can’t qualify for a bank account. And sometimes, they make terrible mistakes, as the 2008 financial crisis made evident.

What would happen if there was an internet of value where parties to a transaction could store and exchange value without
the need for traditional intermediaries? In a nutshell, that’s what blockchain technology offers. Value isn’t saved in a file somewhere; it’s represented by transactions recorded in a global spreadsheet or ledger, which leverages the resources of a large peer-to-peer network to verify and approve transactions. A blockchain has several advantages. First, it is distributed: It runs on computers provided by volunteers around the world, so there is no central database to hack. Second, it is public: Anyone can view it at any time because it resides on the network. And third, it is encrypted: It uses heavy-duty encryption to maintain security.

Blockchain transactions are continuously verified, cleared, and stored by the network in digital blocks that are connected to preceding blocks, thereby creating a chain. Each block must refer to the preceding block to be valid. This structure permanently time-stamps and stores exchanges of value, preventing anyone from altering the ledger. To steal anything of value, a thief would have to rewrite its entire history on the blockchain. Collective self-interest ensures the blockchain’s safety and reliability. Therefore, we think blockchain provides a powerful mechanism for blowing traditional and centralized models, such as that of the corporation, to bits.

The Role of Transaction Costs
In a classic article published in 1937 titled “The Nature of the Firm,” economist Ronald H. Coase noted that there are costs associated with organizing production through the open market rather than through a firm — such as the cost of searching for relevant prices and the cost of negotiating numerous contracts. Coase expected businesses to expand internally until the cost of performing an additional transaction inside the organization become equal to the cost of using the open market. In a 1976 article, scholars Michael C. Jensen and William H. Meckling added another dimension by introducing the concept of “agency costs,” which are the costs associated with managers’ tendencies to make decisions that are not optimal from an owner’s point of view.

Like many other analysts, we envisioned that the internet would reduce transaction costs so that corporate boundaries would become more porous and organizations would seek talent outside their boundaries. As it turned out, the costs fell much further than we expected and in turn lowered barriers to entry for startups and established businesses looking to expand into adjacent areas. To be sure, the internet reduced the costs of search, while email, social media, cloud computing, and applications such as enterprise resource planning reduced the costs of coordination. More broadly, these new capabilities enabled corporations to outsource overhead, crowdsource innovation, and eliminate middle managers and other intermediaries, thus freeing industries such as accounting, commercial banking, and even music to consolidate assets and operations.

Managing With Blockchain
We believe that blockchain will transform how businesses are organized and managed. It allows companies to eliminate transaction costs and use resources on the outside as easily as resources on the inside. Vertical integration may continue to make sense in some situations (for manufacturing controlled pharmaceuticals, for example, or where companies have industry-leading strengths throughout the supply chain). But in most cases, we believe that networks based on blockchain will be better suited for creating products and services and for delivering value to stakeholders.

Human Resources and Procurement
Blockchain will enable organizations requiring specialized talent and capabilities to obtain better information about potential contractors and partners than many traditional recruitment and procurement methods offer. With a prospective employee’s consent, an employer will have access to a cache of information that’s known to be correct because it has been uploaded, stored, and managed on a highly secure, distributable database. For example, job prospects wouldn’t be able to lie about their training or degrees because an authority, such as the university they graduated from, has entered the data on the blockchain. Tampering with data after the fact wouldn’t be possible: It would involve taking over the entire blockchain, a nearly impossible task. Individuals would control their own personal data (including birth date, citizenship,
How Blockchain Will Change Organizations (Continued from page 11)

financials, and educational records) in a virtual black box. They alone would be able to decide what to do with the information.

Human resources and procurement staff will need to learn how to query the blockchain with specific yes or no questions — for example, Do you have this kind of license? Can you code in this specific language? The responses from all the black boxes will provide a list of people who meet these qualifications. Employers can ask whatever they want, and job seekers can program their black boxes with answers or refuse to answer.

Finance and Accounting Information about a business’s financial well-being changes all the time. When you search the web for a company’s financial data, you search in two dimensions: horizontal (across the web) and vertical (within particular websites). What you find can be out-of-date or inaccurate in other ways. On a blockchain, though, there’s a third dimension: sequence. In addition to being able to obtain a historical picture of the company since it was incorporated, you can see what has occurred in the last few minutes. The opportunity to search a company’s complete record of value will have profound implications for transparency as it brings to light off-book transactions and hidden accounts. People responsible for records and reports will be able to create filters that allow stakeholders to find what they are searching for at the press of a button. Companies will be able to create transaction ticker tapes and dashboards, some for internal use and some for the public. As extreme as this may sound, it’s really not.

Sales and Marketing Just as a blockchain provides a way to obtain information about potential contractors and partners, it will be able to tell you about people or businesses who are potential customers. As we have noted, individuals will control access to their own data in virtual black boxes, which will limit a company’s ability to profile customers by tracking and capturing their behavior online. However, the blockchain will allow companies to engage with individual customers on a peer-to-peer basis. This may seem like a lot of effort, but it could actually be a huge opportunity. Some consumers may offer businesses access to their data in exchange for freebies; others will charge fees to license their data. Either way, companies will be able to reach their target audience with greater precision.

What’s more, sellers won’t have to worry about who the customers are and whether they are able to pay. With the new platform, sellers won’t have to incur the cost of establishing trust — thus they can facilitate transactions that would have been risky or might not have been possible otherwise. Furthermore, blockchains will eliminate the cost of warehousing data and protecting other people’s data from security breaches. It should also be easier to target customers who make their interests known.

Despite the advantages of being able to reduce risk, there is also a downside. The ability to make precise queries leads to precise results. This means that there will be much less serendipity. With blockchains, you are less likely to discover people or partners who don’t fit your profile but are open to change, willing to adapt, and eager to learn.

Legal Affairs Coase and subsequent economic theorists have argued that corporations are vehicles for creating long-term contracts when short-term contracts require too much effort to negotiate and enforce. Blockchains facilitate contracting in both the short and long term. Through smart contracts — software that, in effect, mimics the logic of contracts with guaranteed execution, enforcement, and payments — companies will be able to automate the terms of agreement. A contract can refer to data fields elsewhere on the blockchain (for example, a party’s account balance, a change in a commodity price, or an additional sale of a copyrighted work). It can trigger alerts and ensure payments.

Because the contracts will be self-enforcing, corporations will not want to enter into them lightly. Changing the terms of deals (or attempting to manipulate them) will be more challenging. Lawyers and other managers will need to learn how to audit legal templates and make sure the contract software supports what both parties agreed to do. They will also need to become knowledgeable on issues involving the blockchain and smart contracts. The fastest-growing specialty in the law firm of the future is likely to be “smart contract mediator.”

With the new platform, sellers won’t have to incur the cost of establishing trust — thus they can facilitate transactions that would have been risky or might not have been possible otherwise.
Shareholders will be able to enforce the commitments executives make. Companies can specify relationships and state specific outcomes and goals so that everyone understands what the respective parties have signed up to do.

**Raising Capital** We believe blockchains will also transform the process of raising money. In our view, the blockchain has the potential to disrupt the way the global financial system works and change the nature of investment. Mindful of this prospect, the New York Stock Exchange has invested in Coinbase Inc., a digital currency wallet and platform company headquartered in San Francisco, California. For its part, the Nasdaq Stock Market is also experimenting with blockchain technology.

**Integrating the Pieces**

So how will blockchain help companies become stronger competitors? How can a company use it to integrate the various pieces? Blockchain technology provides a platform for people to work together with the persistence and stability of an organization but without the hierarchy. Consider ConsenSys, a venture production studio based in Brooklyn, New York, that builds decentralized software applications and end-user tools that operate on blockchain. Founder Joseph Lubin describes the company’s structure as a hub-and-spoke arrangement rather than hierarchical; each project operates on its own, with the major contributors holding equity. For the most part, people get to choose what they work on. The central hub provides supporting services to the spokes in exchange for a share of the ownership. The various rights and relationships are codified in smart contracts that hold the entity together.

In recent years, we have been reminded all too often that managers don’t always act with the highest degree of integrity. (Think of the scandals at Enron, AIG, and Volkswagen, for instance.) What if we could codify ethics and integrity into the circuitry of the enterprise, or reduce the moral hazard that too often sees management gambling with shareholder capital? Through smart contracts under blockchain, shareholders will be able to enforce the commitments executives make. Companies can specify relationships and state specific outcomes and goals so that everyone understands what the respective parties have signed up to do and whether those things are actually getting done.

On blockchain, executives will someday no longer need to attest that their books are in order once a year or every quarter; the blockchain will keep a company’s books in order in what is, in effect, real time as a matter of course. Financial statements will go from snapshots of the enterprise at one point in time to a transparent, three-dimensional view of the whole enterprise. Shareholders and regulatory agencies alike will be able to examine the books whenever they choose. Institutional investors will have the ability to create their own credit dashboards based on the facts, as opposed to relying on interpretations by ratings agencies. And ratings agencies themselves may overhaul their rating systems based on information from blockchains.

In contrast to the internet, which took two decades to develop and yet another decade to become commercial, the blockchain ecosystem is developing more rapidly as an economic platform. For executives, this means there is little time to waste. They will want to examine their industries and their competitors with an eye toward identifying opportunities for profitable growth.

Executives should begin by identifying people within the company who are interested in the technology or using digital currency. They should talk to people in the company’s IT department about the technology’s implications, buy some bitcoin, and experiment with purchasing inexpensive items on the blockchain to see how it works. At the same time, they should identify nearby companies using blockchain — take the opportunity to visit their operations and talk with people involved, and invite experts to meet with the team. Now is the time to reimagine how your company organizes the way it creates value. If you don’t, someone else will.

*Don Tapscott* is the chancellor of Trent University in Peterborough, Ontario, and CEO of the Tapscott Group Inc. in Toronto. *Alex Tapscott* is founder and CEO of Northwest Passage Ventures, an advisory firm incubating early-stage blockchain companies, in Toronto. They are the authors of *Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World* (Portfolio, 2016). Comment on this article at [http://sloanreview.mit.edu/x/58222](http://sloanreview.mit.edu/x/58222), or contact the authors at smrfeedback@mit.edu.

Reprint 58222.

Copyright © Massachusetts Institute of Technology, 2017. All rights reserved.
After eluding close inspection by most business leaders outside the tech and financial sectors, blockchain technology has recently taken center stage in the conversation about management’s digital makeover. Indeed, some believe that the long-term business impact of blockchains — distributed digital ledgers that enable and record secure online transactions — may be greater than that of the technologies that have grabbed most of our recent attention, such as data and analytics and the cloud.

However, as with any emerging technology, it can be difficult to separate promise from probability. That is among the reasons why a new working paper from MIT Sloan School of Management professor Christian Catalini and University of Toronto Rotman School of Management professor Joshua S. Gans is so valuable: It offers a balanced economic analysis of blockchain and cryptocurrencies such as bitcoin. (See “Related Research,” p. 18.)

Catalini discussed several of the study’s key findings and their relevance for managers in a written exchange with MIT Sloan Management Review editor in chief Paul Michelman. What follows is an edited version of their email conversation.

MIT SLOAN MANAGEMENT REVIEW: What prompted you to look at blockchain through an economics of innovation lens? What was it that you felt you knew — or suspected — before you began your investigation?

Catalini: There is substantial hype around blockchain and cryptocurrencies. As often happens when a breakthrough technology is on the horizon and uncertainty about its use case is high, it becomes tempting to overstate its benefits and ignore the fact that technological change takes time to unfold and often requires entire ecosystems to adapt. Architectural changes in how value is created and appropriated within a given market do not happen overnight. They will generate resistance from regulators, who are trying to assess the risks the new technology involves, and from incumbents, who are worried about new entrants cannibalizing their revenue models.

In this phase, you often see strong polarization in opinions: On one side, you have detractors who highlight the current limitations of the technology (for example, the fact that bitcoin can process only a small number of transactions per second or that bitcoin mining is highly concentrated in China) and use them to support their view that nothing will change. On the other side, you have the utopians who believe that the technology on its own can solve all the problems of our financial system. The truth, of course, is somewhere in the middle. Economic theory can be extremely helpful in these cases: You take a step back, try to ignore the noise, and focus on the basic assumptions the technology is challenging. This is a difficult exercise, and our paper is just a first attempt in this direction.
Seeing Beyond the Blockchain Hype (Continued from page 17)

We started by asking ourselves: What fundamental costs does blockchain reduce? If you can answer this question, it becomes much easier to identify where the opportunities are, whether you are an established company, a startup, or a regulator. Applications that do not take advantage of the structural changes in costs that the technology allows for are unlikely to succeed, as they will have a difficult time convincing consumers and businesses to adopt. Similarly, solutions that claim benefits the technology cannot currently deliver are likely to fail.

So, can blockchain reduce costs in a significant way? Where will we see an impact first?

Yes, we concluded that at least two key costs will be affected: the cost of verifying the attributes of a transaction (for example, when did it take place, who was involved, etc.) and the cost of exchanging value within a network without relying on a costly intermediary.

The ability to securely record and time-stamp information on a blockchain is extremely valuable when issues arise with a transaction. Whereas today we often have to invest resources to audit the transaction and assess the truth, in the future these tasks could be automated thanks to a distributed ledger.

This makes settlement and reconciliation across organizations simpler and more efficient, which explains why many early use cases for blockchain are in the financial sector. Here, the compelling reason to adopt is the ability to lower operational costs while keeping the rest of the ecosystem the same. It also explains why banks and financial institutions like distributed ledgers but are worried about cryptocurrencies. Distributed ledgers, on their own, do not challenge existing revenue models and regulatory frameworks. In fact, they may even allow incumbents to achieve greater economies of scale. Cryptocurrencies, in contrast, present an existential threat to how value is generated and appropriated in the economy.

This is where the second cost — the cost of networking — plays a key role: Before cryptocurrencies such as bitcoin existed, we needed intermediaries to transfer value across the globe. Creating and maintaining a secure network was both capital-intensive and labor-intensive. Bitcoin solves this problem by throwing cheap hardware at it: While often criticized for the energy-consuming computations needed to secure it, the bitcoin network has been extremely successful at automating value transfer. Where secure financial messaging platforms such as SWIFT and ACH have to invest in maintaining “trusted nodes” to validate transactions, bitcoin uses a clever mix of cryptography and game theory to deliver the same results. Gone are the accounting, reconciliation, and security costs associated with ensuring that a rogue employee or financial institution did not tamper with the transaction. The integrity of the underlying data is not guaranteed by an intermediary but by the design of the system itself. This is the architectural innovation associated with cryptocurrencies, and it constitutes both an opportunity and a threat to existing business models.

How does an organization begin to move in the direction of exploiting blockchain technology in the ways you describe here?

In terms of the cost of verification, an organization should ask where resources are currently being wasted in auditing transaction information, reconciling accounting books across different entities, and securing the integrity of digital trails both within as well as outside the boundaries of the organization. By recording transaction attributes on a blockchain, organizations can ensure that auditing them in the future, if a dispute emerges, is cheap.

Of course, the immutability offered by a distributed ledger is helpful only if the information it recorded is accurate in the first place. Hence, the cheaper it is to commit information early in the value chain and in an automated and tamper-proof fashion, the better. Similarly, the more one can envision replacing labor-intensive and time-consuming tasks with a combination of software and a “shared source of truth,” the more the technology is likely to be useful. Early applications on this front range from the trading and settlement of currencies and financial assets to the tracking of ownership stakes in early-stage companies. For example, in 2015 Nasdaq experimented with executing a private securities transaction for San Francisco-based blockchain startup Chain Inc. on a distributed ledger, removing the manual steps typically involved in the process. Similarly, New York-based Digital Asset Holdings LLC is developing distributed ledger technology for the Australian Securities Exchange post-trade market, and startups such as Boston-based Circle Internet Financial Inc. and Plutus Financial Inc. (d/b/a Abra), based in Mountain View, California, are already using blockchain to lower the cost of transferring money across the globe.

Overall, most existing organizations are likely to benefit from a reduction in verification costs, as this change may not challenge their revenue models and may instead reduce frictions within their existing value chains. The exceptions are organizations that currently profit from securing the transfer of value: For them, blockchain represents a threat to their margins. For example, in the absence of added-value services, key components of payment networks can be commodified using distributed ledgers.

Changes in the cost of networking — although they will take
longer to unfold — are more likely to be substantial. The ability to bootstrap a marketplace without the need for a central actor constitutes a radical departure from how most organizations appropriate value within their ecosystem today. Cryptocurrencies enable a hybrid type of organization that can take advantage of both the efficiency of a market and the more complex forms of contracting and governance that take place within companies or on online platforms. By sourcing capital, talent, and ideas through smart contracts, such organizations will be possibly able to move and allocate resources at a speed previously unimaginable. Many of the online platforms that rely today on their ability to process payments between buyers and sellers and on controlling a reputation system (such as Uber Technologies Inc. and Airbnb Inc.) may face increased competition from open protocols that source resources and allocate returns in a more flexible way.

Early experiments in this space include startups like San Francisco-based Numerai LLC, a hedge fund that makes investment decisions on the basis of crowdsourced predictions generated by a distributed network of data scientists. The data scientists rely on a cryptocurrency to both disclose their confidence in their models and appropriate the returns from their contributions. In addition, a smart contract ensures that participants do not have an incentive to “overfit” their data, as rewards are linked to the long-run ability of the hedge fund to make good investment decisions.

**Who — which people, which functions — within the organization should be leading the investigation of blockchain?**

Early on, the ideal team would probably include the CEO, chief technology officer, chief economist, and some of the key people directly reporting to them. The objective would be to map the idiosyncratic opportunities and challenges cryptocurrencies and blockchain pose for the company and create the right platform for small, cross-functional, entrepreneurial teams to explore novel applications further. In many of these cases, projects will be early stage and high risk, and require collaboration outside the boundaries of the company. Ideally, they would also receive enough autonomy to explore business models that are potentially inconsistent with how the organization currently operates and secures revenues, or at least receive enough funding to make strategic investment decisions in relevant startups.

Comment on this article at http://sloanreview.mit.edu/x/58417 or via smrfeedback@mit.edu.

Reprint 58417.
Copyright © Massachusetts Institute of Technology, 2017. All rights reserved.
How Blockchains Could Transform Management
THEODORE KINNI

What’s happening this week at the intersection of management and technology.

Re-architecting the firm with blockchain: Is Craig Wright really Satoshi Nakamoto, the mysterious creator of Bitcoin? Who knows — and really, who cares? The bigger issue is blockchains, the distributed ledgers that underpin cryptocurrencies like Bitcoin.

Blockchain technology has so many uses that trying to summarize them can make veteran tech experts sound like PR hacks. “As such, it holds the potential for unleashing countless new applications and as yet unrealized capabilities that have the potential to change everything,” write Don Tapscott and his co-author and son Alex Tapscott in their new book, Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money, Business, and the World.

That might sound like hyperbole, but it seems like everywhere you turn these days you run into blockchains. Banks are trying to harness blockchain before its blows up their business models. IBM is betting on blockchains to give its revenues a bump. Disney has a blockchain team doing … well, who knows what.

What we haven’t heard very much about is how blockchain could fundamentally change how companies are managed and operate. That’s a good reason to take a closer look at Blockchain Revolution, in which the Tapscotts devote a chapter to the topic. “Blockchain technology is enabling new forms of economic organization and new portfolios of value,” they write. “There are distributed models of the firm emerging — ownership, structure, operations, reward, and governance — that go far beyond enhancing innovation, employee motivation, and collective action.”

Intrigued? If you’d like read more about how blockchains might change the everyday operation of a business, check out the excerpt from the chapter, reprinted with permission, below.

How Do We Find New Talent and New Customers?

How do we find the people and information we need? How do we determine if their services, goods, and capabilities are best for us as we seek to bring the tonic of the market to bear on our internal operations?

Although the architecture of the firm is basically intact, the first era of the Internet dropped such costs significantly and enabled important changes. Outsourcing was really just the beginning. Tapping into ideagoras (open markets for brainpower), companies like Procter & Gamble are finding uniquely qualified minds to innovate a new product or process. In fact, 60 percent of P&G’s innovations come from outside the company, by building or harnessing ideagoras like InnoCentive or inno360. Other firms like Goldcorp have created global challenges to search for the best minds to solve their toughest problems. Goldcorp, which published its geological data and talent outside its boundaries, discovered $3.4 billion worth of gold, resulting in a hundredfold increase in the company’s market value.

Now imagine the opportunities that arise from the ability to search the World Wide Ledger, a decentralized database of much of the world’s structured information. Who sold which discovery to whom? At what price? Who owns this intellectual property? Who is qualified to handle this project? What medical skills does our hospital have on staff? Who performed what type of surgery with what outcomes? How many carbon credits has this company saved? Which suppliers have experience in China? What subcontractors delivered on time and on budget according to their smart contracts? The results of these queries won’t be resumes, advertising links, or other pushed content; they’ll be transaction histories, proven track records of individuals and enterprises, ranked perhaps by reputation score. Get the picture? Said Vitalik Buterin, founder of the Ethereum blockchain, “Blockchains will drop search costs, causing a kind of decomposition that allows you to have markets of entities that are horizontally segregated and vertically segregated. That never really existed before. Instead you had kind of monoliths that do everything.”

Several companies are working on search engines for blockchains, given the potential bonanza. Google’s mission is to organize the world’s information, so it would make sense for it to assign considerable manpower to investigate this.

There are three key distinctions between Internet search and blockchain search. First is user privacy. While transactions are transparent, people own their personal data and can decide what to do with it. They can participate anonymously or at least pseudonymously (anonymity through a false name) or quasinonymously (partial anonymity). Interested parties will be able to search for information that users have made open. Andreas Antonopoulos said, “Transactions are anonymous if you want them to be anonymous … but the blockchain enables radical transparency a lot easier than it enables radical anonymity.”

Many firms will need to rethink and redesign the recruiting process. For example, human resources or personnel staff will need to learn how to query the blockchain with yes/no questions: Are you a human being? Have you earned a PhD in applied mathematics? Can you code in Scrypt, Python, Java, C++? Are you available to work full time from January through June next year? And other qualifications. These queries will scurry about the black boxes of people on the job market and yield a list of people who meet these qualifications. They could also pay prospective talent to place pertinent professional information on a blockchain platform where
they can sort through it. HR staff must master the use of reputation systems, moving forward with candidates without knowing anything irrelevant to the job, such as age, gender, race, country of origin. They also need search engines that can navigate various degrees of openness, from fully private to fully public information. The upside is an end to subconscious or even institutional bias and headhunter or executive recruiting fees. The downside is that precise queries lead to precise results. There is less possibility of serendipity, the discovery of a candidate who lacks the qualifications but has great capacity to learn and to make the random creative connections that a firm desperately needs.

Ditto for marketing. Firms may have to pay just to query a prospective customer’s black box, to see whether that customer meets a firm’s target audience. That customer may decide globally to withhold certain data such as gender, because a no answer is still valuable. But in so doing, the firm will learn nothing more about the prospect beyond the yes/no results of the query. Chief marketing officers and marketing agencies will need to rethink any strategy based on e-mail, social media, and mobile marketing: where the infrastructure may lower communications costs to zero, customers will raise costs to a figure that makes reading a firm’s message worth their while. In other words, you’ll be paying customers to listen to your elevator pitch, but you will have tailored your query to pitch only to a sharply defined audience so that you will be reaching exactly the people you want to reach without invading their privacy. You can test different queries to learn about different microniches at every stage of new product development. Let’s call it black box marketing.

The second distinction is that search can be multidimensional. When you search the World Wide Web today, you search a snapshot in time, as indexed over the last several weeks. Computer theorist Antonopoulos called this two-dimensional search: horizontal, a wide search across the Web, and vertical, a deep search of a particular Web site. The third dimension is sequence, to see these in the order of uploading over time. “The blockchain can add the additional dimension of time,” he said. The opportunity to search a complete record of everything that ever happened in three dimensions is profound. To make his point, Antonopoulos searched the bitcoin blockchain to find its famous first commercial transaction, the purchase of two pizzas done by someone named “Laslo” for 10,000 bitcoins. “The blockchain provides an almost archaeological record, a deep find, preserving information forever.” (To save you from doing the math, if the pizza costs $5 when $1 was equal to 2,500 bitcoins, that would be worth $3.5 million as of the writing of this book … but we digress.)

For firms, this means a need for better judgment: managers need to hire people who have demonstrated good judgment, because there’s no walking back poor decisions, no spinning the order of events, no denying an executive’s disreputable behavior. For really important decisions, firms could implement internal consensus mechanisms whereby all stakeholders vote on mission-critical decisions to end the chorus of ignorance and denial of prior knowledge. Or use prediction markets to test scenarios. If you’re an executive of a future Enron, no scapegoating. As for New Jersey governor Chris Christie, good luck telling a prosecutor that you knew nothing of plans to close the George Washington Bridge.
The third distinction is value: where information on the Internet is abundant, unreliable, and perishable, it is scarce, tamperproof, and permanent on the blockchain. To this last characteristic, Antonopoulos notes: “If there is enough financial incentive to preserve this blockchain into the future, the possibility of it existing for tens, hundreds, or even thousands of years cannot be discounted.”

What an amazing concept. The blockchain as part of the archaeological record, like the original stone tablets of Mesopotamia. Paper records are ephemeral and temporary, whereas (ironically) the oldest form of recording information, tablets, is the most permanent. The implications for corporate architecture are considerable. Imagine a permanent, searchable record of important historical information, like the history of finance. Corporate staff responsible for developing financial statements, annual reports, reports to governments or donors, marketing materials for prospective employees, clients, and consumers—will start with this public, indisputable view of their firm, maybe even creating a filter that enables stakeholders to see what they see at the press of a button. Companies could have transaction ticker tapes and dashboards, some for internal managerial use and some public. Rest assured: All your competitors will construct such feeds and dashboards of your firm as part of their competitive intelligence programs. So why not put those on your Web site and draw everyone to you?

This provides enormous incentive for firms to look for resources outside their boundaries, as they have almost infinitely better information about the qualities and record of candidates, be they individuals or companies.

Companies like ConsenSys are developing identity systems where job prospects or prospective contractors will program their own personal avatars to disclose pertinent information to employers. They can't be hacked like a centralized database can. Users are motivated to contribute information to their own avatars because they own and control them, their privacy is completely configurable, and they can monetize their own data. This is very different from, say, LinkedIn, a central database owned, monetized, and yet not entirely secured by a powerful corporation.

[Who could] have imagined a platform that could drop search costs so that firms could find capability outside their boundaries that cost less and could perform better?

The innovation hub — same as it ever was? The Internet has wrought significant changes in how we work, but some things — innovation hubs, for example — remain remarkably durable. “For hundreds of years,” writes freelance journalist Emily Sohn in Nature, “regions developed specialities that often arose from access to a natural resource, but then intensified as people moved to the regions to be among the expertise. The Internet was supposed to change all that. Around-the-clock connectivity that allowed researchers and entrepreneurs to collaborate from anywhere at any time meant that distance would no longer be an issue, predicted popular economic theory of the early 2000s. A decade later, it hasn't panned out that way.”

Sohn reports that global connectivity seems to have stimulated the growth of innovation hubs, like Silicon Valley, rather than shrunk them. “Innovators and PhD students are now clumped together in fewer places, often in big cities,” she says. “And collaborations are more likely
to happen between researchers who live, or have lived, close to each other.”

New and existing companies can’t afford to buck this finding. Locating in innovation hubs gives them greater access to talent. It also boosts their performance: Sohn cites studies that show start-ups located in hubs are more likely to survive, and firms in hubs are more likely to file patents than companies outside hubs.

It turns out that no matter how easy it is to collaborate at a distance, proximity remains an essential element in stimulating innovation. It sets the stage for serendipitous meetings. Face-to-face interaction also creates feel-good reactions in our brains that promote trust and more effective collaboration.

It’s not that digital connectivity inhibits innovation. Far from it, reports Sohn. Rather, it stimulates the enhanced innovation that is already taking place within innovation hubs — in effect, supercharging it. It’s a finding worth keeping in mind that next time your company is considering where to locate a new business unit or research facility.

**Putting data to work with knowledge graphs:** A brief story popped up in The Seattle Times last week: A data analytics company named Maana announced it had raised $26 million in Series B funding from the investment arms of Saudi Aramco and Shell. In these (waning) days of billion-dollar start-up valuations, $26 million isn’t especially jaw-dropping. But the company does have an interesting approach to data analytics, which uses “enterprise knowledge graphs.”

There are a couple of problems with data in big companies. First, there’s lots of it, and it’s often stashed in separate silos. “A single division could have over 60 different information systems that they work with,” CTO Donald Thompson told tech reporter Rachel Lerman. Second, you need to turn the data into useful insights and recommendations. Third, you have get those into the hands of people who can use them to enhance results.

Bearing in mind that I’m a layman at best, here’s how Maana approach works: Instead of placing the company’s data into a common pool, it sends out a search engine to crawl the various data silos in your company. Then, instead of simply delivering a list of results, it uses analytics and machine learning to construct knowledge graphs — kind of like the ones that Google introduced a few years back — that provide actionable recommendations based on the goals and needs of the business and delivers them to line-of-business applications. Maana has used cases on its website that show how this approach works and the results it has produced in operational settings in industrial and oil and gas companies.

**About the Author**

Theodore Kinni is a business journalist, author, and ghostwriter. He blogs at Reading, Writing re: Management and tweets @tedkinni.
WHAT PROBLEMS WILL YOU SOLVE WITH BLOCKCHAIN?

Before jumping on the bandwagon, companies need to carefully consider how ledger technologies fit into their overall strategy.

BY TEPO FELIN AND KARIM LAKHANI

DISTRIBUTED LEDGER TECHNOLOGIES — collectively known as blockchain — have burst onto the business scene, accompanied by a significant amount of hype. They are widely expected to disrupt existing industries and lead to the creation of new types of companies.

Some of the excitement may indeed be warranted, but only if organizations focus on how these technologies can be used to support their strategy. Without that lens, companies risk making large investments in initiatives that don’t create meaningful value.

However, with careful planning, businesses can use blockchain to gain an edge over rivals in a number of ways. It can provide a foundation for powerful applications that will streamline core operations. Distributed ledger technologies can lower transaction costs and make intellectual property ownership and payments more transparent, seamless, and automated. But companies should resist jumping on the bandwagon until they first understand
THE LEADING QUESTION

How can companies strategically benefit from blockchain?

FINDINGS

• For both startups and incumbents, distributed ledger technologies can enable new business and operating models.
• They can also help companies disrupt existing industries.
• To create value, companies need to systematically link blockchain technology with their strategy and capabilities.

What specific problems they can solve with blockchain — and for whom. How will it help them reach new customers? How can it improve efficiency or transparency in their supply chains? And most important, what will blockchain enable them to do that competitors and new entrants can’t do? Answering these sorts of practical, targeted questions will allow businesses to cut through the hype and create a blockchain strategy that makes sense for them.

To begin, it’s critical to understand the basic uses and functionalities of blockchains, which tend to get lost in the buzz. So we will provide a quick primer on digital ledgers before discussing how companies should build powerful problem-solving applications that are uniquely configured to their own strategies.

The Power of a Ledger

The first known ledgers date back some 5,000 to 10,000 years to Mesopotamia, where simple clay tokens and stone tablets were used as markers of transactions. They were a centralized form of record keeping that helped people keep track of things like the price of barley, who bought the barley from whom, or who owned or purchased a piece of land.

Over time, such ledgers formed the basis of wide-scale economic development and activity. They allowed people to gauge who could be trusted, leading to the emergence of reputation, credit, and long-distance trade. Moreover, they helped resolve disputes about goods sold and money owed.

In their simplest form, blockchains are the digital equivalent of the old stone ledgers. They are memory devices — a kind of database — for recording and verifying transactions and terms of engagement. Just like their ancient counterparts, they can record information about any number of things: who owns a specific asset, who bought a particular product from whom, or who has the right to make a certain type of decision. And all of this information can be aggregated to develop insights about, say, the reputations of parties involved or the origins of the supply chain of a particular commodity.

What makes blockchains so powerful, however, is the fact that they are distributed and digital. Rather than having to physically record transactions in one place, any authorized party can be given access to either the entire ledger or specified portions. As transactions take place between parties, the distributed digital copies of the ledger are instantly and simultaneously updated, and the record of each transaction is indelibly recorded through advanced computational algorithms and cryptographic locks. Depending upon the rules of the particular blockchain, participating parties can be either identified or anonymous. The decentralized nature of the ledger means that parties can more easily interact with each other — and have confidence that the record of the interactions will be fully memorialized.

Problems That Blockchain Can Address

In creating a blockchain, organizations need to define the specific problem they are trying to solve. Then they must determine which transactions or interactions the blockchain should capture and who should have access to which portions. (See “Key Questions for Companies Designing Blockchains,” p. 36.) Blockchains can be scaled and used to interact with any number of different stakeholders, whether customers, employees, suppliers, or other companies. Verification is a key benefit.

Take the seemingly simple task of verifying someone’s educational or employment credentials. A frequent problem employers face is that anyone can claim on a LinkedIn profile or on a CV that he or she completed a degree at a particular university or worked for a particular company. A blockchain identity solution could automatically verify an individual’s credentials for relevant third parties.

The types of problems that blockchains can solve are far-ranging, spanning many industries and contexts. Here we will explore just a few common examples.

Paying for contributions to intellectual property. The video game industry offers a useful window into what’s possible when you define a problem that a particular set of stakeholders face — and then design a blockchain to solve the problem. In this case, the stakeholders were the people contributing their creativity and smarts to developing games. And the problem was the cumbersome, archaic way in which royalties and rights were managed across the industry.

SPECIAL COLLECTION • “PREPARING FOR A BLOCKCHAIN FUTURE” • MIT SLOAN MANAGEMENT REVIEW 15
Developing a video game typically involves production companies and game-publishing houses (such as Sony Interactive Entertainment, Tencent Games, Microsoft Studios, and Electronic Arts), development companies, video game console makers, computer manufacturers, and mobile phone makers, as well as contractors — writers, voice actors, composers, musicians, and so on.

For instance, development of the multibillion-dollar hit Grand Theft Auto V (which has grossed $6 billion in revenues between 2013 and 2018), while credited to Rockstar North, a small company based in Scotland, was actually the work of more than a thousand people from many different companies and corporate sub-entities, as well as scores of contractors. To orchestrate all of this, companies have traditionally relied on idiosyncratic agreements and cumbersome one-off payments to compensate their myriad partners. The use of royalties — and the intricacies of how to manage and distribute these payments — has further complicated the picture. Until recently, developers, actors, and other contributors have had little sense of the size of the royalty they might be entitled to. Moreover, the payments often took months or longer to arrive.

Microsoft and Ernst & Young (EY) studied these inefficiencies and designed a blockchain to address the problems and provide transparency. The intellectual property blockchain they created enables companies and individuals to clearly specify, account for, and track the attribution of digital content throughout the network of stakeholders involved in the development and release of a video game. Using the blockchain, authorized participants can see a breakdown of royalty payments — as well as data about sales and distribution — on a real-time basis. The blockchain also allows for the easy creation of “smart contracts,” which can specify and enforce rates of payment and other terms. This automates processes that previously were extremely labor-intensive, opaque, and costly. Legal and royalty negotiations can now be simplified with a menu of licensing and revenue-sharing options, and agreements can be implemented quickly and transparently.

Of course, the long-term success of this venture will depend on many factors, such as the incentives for others in the industry to adopt this particular blockchain. (If adoption isn’t widespread, the blockchain becomes less powerful.) Still, Microsoft is likely to reap some benefits, as it now can interact more efficiently with the large ecosystem of developers, particularly those who develop games for its Xbox platform.

To be sure, Microsoft and EY aren’t the only ones tackling problems related to the management of intellectual property, digital rights, and knowledge work. A plethora of companies have been looking at this area from one perspective or another. In music, for example, Mycelia, a blockchain initiative launched by British musician and record producer Imogen Heap, is attempting to become a digital management platform for musicians, helping them manage contracts, allocate payments, and track their creative works. (For similar examples, see “Blockchain Is Changing How Media and Entertainment Companies Compete,” p. 39.)

Establishing history of ownership. In addition to addressing problems related to intellectual property and licensing, blockchain is being used to establish origins and ownership. Consider the diamond industry, which has long been subject to corrupt activity. In western and central Africa, for example, rebel groups have used “blood diamonds” to finance armed conflicts against governments. In response, the diamond industry has attempted to create provenance certification programs. The proper tracking of diamonds could bring much-needed transparency to the industry, ensuring that blood diamonds do not support insurgents’ efforts by preventing the gems from entering the supply chain.
chain in the first place. However, these efforts haven’t been easy, as paper-based certification systems are prone to fraud and corruption.

London-based Everledger is one company attempting to address this type of problem using blockchain. Everledger offers provenance tracking and verification for a variety of luxury goods, providing new value to industry players and reassuring customers concerned about the source and quality of their goods. It claims to have added more than 1 million diamonds to its blockchain, allowing it to track not only their origination but also the entire chain of custody up to present ownership. Through blockchains, Everledger seeks to reduce the more than $2 billion cost of annual jewelry fraud and bring transparency and authenticity to the diamond trade. Various jewelry companies, including De Beers and Hong Kong-based Chai Tai Fook, have launched similar efforts.

Making supply chains more efficient and transparent. The ability to track provenance can address another type of problem: reducing the amount of inefficiency and lack of clarity in supply chains. In early 2018, the Danish shipping giant Maersk and IBM announced a joint venture to create a real-time digital ledger for global shipping. The cargo, transport, and shipping industry has long suffered from a lack of transparency with regard to the sourcing and timing of shipments, which public ledgers might be able to solve.

Other companies are developing their own distributed ledgers to cover their entire supply chains. Walmart provides a good example. For decades, a critical aspect of Walmart’s competitive advantage has been its point-of-sale inventory system, which allows the company to track information about sales in real time so it can quickly adapt its product mix to local needs and trends. However, a distributed ledger will extend this advantage by recording the origins of raw materials and products in the supply chain. This will also allow for more transparent consumer labeling and answer questions about sustainability in a more timely and detailed fashion.

Walmart has already started to use blockchain

---

**KEY QUESTIONS FOR COMPANIES DESIGNING BLOCKCHAINS**

By examining what they are trying to do with blockchain, what value they want to capture with it, and which stakeholders they hope to serve, companies can use the technologies to solve strategic problems in a more targeted way.

<table>
<thead>
<tr>
<th>WHAT ARE YOU TRYING TO DO?</th>
<th>WHAT VALUE DO YOU WANT TO CAPTURE?</th>
<th>FOR WHOM?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record</td>
<td>Information and knowledge</td>
<td>Customers</td>
</tr>
<tr>
<td>Track</td>
<td>Attribution and responsibility</td>
<td>Employees</td>
</tr>
<tr>
<td>Verify</td>
<td>Access or permission</td>
<td>Suppliers</td>
</tr>
<tr>
<td>Aggregate</td>
<td>Decision rights or votes</td>
<td>Producers or makers</td>
</tr>
<tr>
<td></td>
<td>Ownership or incentives</td>
<td>Creditors or investors</td>
</tr>
<tr>
<td></td>
<td>Reputation and trust</td>
<td>Governments</td>
</tr>
<tr>
<td></td>
<td>Contracts</td>
<td>Citizens</td>
</tr>
<tr>
<td></td>
<td>Transactions</td>
<td></td>
</tr>
</tbody>
</table>
Unfortunately, there’s no easy answer for how any particular company should utilize or implement blockchain — if there were, everyone would be doing it. So, where should managers begin? In our view, companies can go a long way toward developing the right approach to blockchain by carefully considering three aspects of uniqueness: their strategy, the capabilities they bring, and the problems they can solve for stakeholders. These three aspects are mutually reinforcing, and it’s in the interactions between them that companies can create significant value above and beyond what competitors might be doing.

A company’s strategy is its distinctive point of view about how to create and capture value — it’s the one thing that can’t be outsourced. For starters, then, companies need to think their strategy through to ensure it embodies their beliefs and hypotheses about the emergence of new markets and the possibility of new products that have yet to be imagined. Although companies can create value by cooperating and interacting with others, such interactions should be organized in unique ways. And it’s here, at the nexus of uniqueness and cooperation, that blockchains have the potential to generate significant value. For example, partnerships such as the Microsoft and EY blockchain initiative discussed earlier can be seen as a targeted form of “open innovation” that enables different organizations and individuals to take advantage of their respective strengths in conjunction with others. Microsoft brings a vast mix of resources and past gaming industry experience to this collaboration, and EY brings its own set of resources. A joint effort thus can create significant value beyond what either company might be able to do alone. But such partnerships need to be carefully crafted to suit the particular circumstances.

Companies likewise need to understand how to configure, design, and use blockchain technologies in unique ways. Some may be tempted to adopt a wait-and-see attitude regarding blockchain and become late adopters. Understandably, many managers will worry that large investments in the technologies will outpace the gains. That’s a valid concern. But blockchains promise to be as fundamental as the internet in shaping how future business will be conducted. Therefore, a wait-and-see attitude could be costly.

Unfortunately, there’s no easy answer for how any particular company should utilize or implement blockchain — if there were, everyone would be doing it. So, where should managers begin? In our view, companies can go a long way toward developing the right approach to blockchain by carefully considering three aspects of uniqueness: their strategy, the capabilities they bring, and the problems they can solve for stakeholders. These three aspects are mutually reinforcing, and it’s in the interactions between them that companies can create significant value above and beyond what competitors might be doing.

A company’s strategy is its distinctive point of view about how to create and capture value — it’s the one thing that can’t be outsourced. For starters, then, companies need to think their strategy through to ensure it embodies their beliefs and hypotheses about the emergence of new markets and the possibility of new products that have yet to be imagined. Although companies can create value by cooperating and interacting with others, such interactions should be organized in unique ways. And it’s here, at the nexus of uniqueness and cooperation, that blockchains have the potential to generate significant value. For example, partnerships such as the Microsoft and EY blockchain initiative discussed earlier can be seen as a targeted form of “open innovation” that enables different organizations and individuals to take advantage of their respective strengths in conjunction with others. Microsoft brings a vast mix of resources and past gaming industry experience to this collaboration, and EY brings its own set of resources. A joint effort thus can create significant value beyond what either company might be able to do alone. But such partnerships need to be carefully crafted to suit the particular circumstances. Companies must determine what they bring to the table and how blockchains can support their strategy in ways that are not foreseen by others, and then design and use blockchains accordingly — whether working alone or in collaboration with others.

Next, the strategy needs to be linked to the company’s unique capabilities and resources. Established businesses often develop capabilities over time as they interact with their suppliers, customers, and stakeholders. Small companies and startups often have difficulty replicating these
capabilities (particularly in areas such as marketing, human resources, and finance). Rather than being caught off guard by new entrants, companies should review their existing resources and look for ways to leverage them with blockchain. Understanding one’s capabilities is essential to the implementation of blockchain solutions. Again, companies need to bring something distinctive to the table beyond simply “buying” the technology and skills.

Finally, uniqueness relates to the problems that the company is attempting to solve for its customers and other stakeholders. That’s where there tends to be a lot of low-hanging fruit and where blockchain technology can potentially be operationalized relatively quickly. Companies should consider how the technology can enable faster, more efficient interaction or increased transparency for their customers or suppliers.

A simple exercise for managers is to carefully list the problems that the company is currently solving or grappling with as they relate to different stakeholders. For each problem, managers can explore in parallel how the previously discussed uses of blockchain (for recording, tracking, verifying, and aggregating) might improve existing practices. Thinking about how various activities can help solve problems — for customers, employees, and suppliers — and carefully unpacking those activities, step by step, will help managers identify blockchain solutions that can generate real value.

The buzz around blockchain probably won’t subside any time soon. But companies can get beyond it by taking the time to understand what the technologies are capable of doing and then systematically configuring blockchains in ways that align with their unique strategy, their existing capabilities, and the problems they can solve.

**Teppo Felin** (@teppofelin) is a professor of strategy at the University of Oxford’s Said Business School. **Karim Lakhani** (@klakhani) is the Charles E. Wilson Professor of Business Administration at Harvard Business School and cofounder of its Digital Initiative. Comment on this article at [http://sloanreview.mit.edu/x/60115](http://sloanreview.mit.edu/x/60115).

**REFERENCES**


Reprint 60115.

Copyright © Massachusetts Institute of Technology, 2018. All rights reserved.
THOUGH blockchain technology began as an innovative digital-currency tool in the financial sector, all kinds of companies are now experimenting with its core capability as a decentralized and secure ledger to manage digital assets more directly and to rethink how they compete in the marketplace. In a recent study, two of us found that more than 1,100 startups were attempting to develop blockchain-based business models in a range of settings, including health care, telecommunications, energy, retail, aviation, real estate, and supply-chain management. So far, there has been no significant impact on the respective markets in terms of revenue and market share, but managers’ and investors’ expectations for future returns are high, as indicated by the flow of money into blockchain startups.

In particular, several new business models are emerging in the media and entertainment industries, where monetizing value has been — and continues to be — a significant challenge. Newspapers and magazines, for instance, still struggle to monetize value in the face of plentiful free content and limited mechanisms for protecting intellectual property. Advertising revenue, long an important income source for publications, has shifted to social media and search platforms, and media companies must figure out how to compensate. In the music world, to cite another example, digital content distribution via streaming is beneficial to major record labels and top-tier artists. But it isn’t commercially viable for smaller
FINDINGS

• Content creators can gain more control over their work and a greater share of the content revenue.
• Content aggregators can leverage blockchain technology to handle some processes more efficiently.
• For distributors, the threat of disruption is real.

THE LEADING QUESTION

How can blockchain help companies monetize content, optimize processes, and compete against rivals?

The empirical findings from the research suggest that blockchain technology represents a major threat to traditional businesses. The disruptive business models that companies have developed to leverage blockchain's potential can be classified into three types: transactions, micropayments, and smart property.

Transactions

The research found that many businesses can identify with and learn from in an age of digital transformation, so we’ll focus on them in this article.

We studied blockchain-enabled business models in 20 startups involved in producing and distributing various types of content — ventures in music, TV and video, publishing, social media, video games, and digital art. In that research and analysis, we identified several applications and business models that are changing how companies manage digital assets and capture revenue. Disruptive business models could have devastating impacts on existing players and should be seen as major threats. However, we found that other models could help incumbent companies become more competitive. So companies can position themselves, we classified the new blockchain-enabled business models as either disruptive or sustaining. (See “About the Research.”)

Promising New Applications

At its core, blockchain is a vehicle for organizing and storing data shared among members of a network. Using sophisticated cryptography, verification, and incentive mechanisms, blockchain networks allow participants to agree on what constitutes valid and acceptable transactions; the idea is that no central authority controls the data or ensures consistency. (See “What Problems Will You Solve With Blockchain?” p. 32.) In our research, we identified several blockchain applications that media and entertainment startups are using. Here, we’ll focus on applications that were most frequently used by those startups and can also be used in other industries.

Smart property. Many companies are starting to use “smart property” to track and enforce rights for creators of digital content, including music, video, books or articles, or even art. This application relies on blockchain as a secure database. Consider Monegraph, which provides an ownership registration service for digital art using the Bitcoin blockchain, the foundation of the most popular decentralized digital currency. By storing IP information on digital artwork, Monegraph’s platform enables artists to define their licensing terms and facilitate transactions with publishers or digital-art buyers. Once their ownership of an asset is recorded in the blockchain, it can be easily accessed and verified by anyone — and cannot be refuted or falsified. This solidified ownership record makes smart property potentially useful in other industries, too, such as real estate and collectibles, where companies need to verify ownership history, simplify asset transfers to new owners, and reduce intermediation costs.

Micropayments. Another popular application, cryptocurrency, facilitates micropayments to content providers. Companies use it for enabling customers to buy and play single songs or videos, for instance, or to purchase permission to read a news article. A blockchain-based startup called Yours operates a digital platform on which authors and other content creators publish their work and charge fees in the form of Bitcoin Cash (a spinoff of Bitcoin). Since transaction costs in Bitcoin Cash are extremely low and no banks or credit card companies are needed to complete a sale, authors can charge as little as a few cents per article and publish and monetize their content themselves. As you can imagine, this capability also holds promise in other contexts — for example, allowing customers to pay for items in vending machines or providing simple financial services in countries with underdeveloped banking infrastructures.

Smart contracts. A third type of application, the smart contract, is used to enforce license terms and dispense payments in financial transactions. For instance, it could allow certain digital content to be published and downloaded at a defined time and price — and could then split the payout among content creators. So, when a consumer downloads, say, a song, the smart contract would automatically kick in, charging the buyer and distributing the revenue in pre-negotiated proportions to the specified stakeholders. Ujo Music, a music software services company, used a smart contract application in 2017...
in what it claims was the very first launch of an artist’s album on a blockchain. Under the contract terms, consumers could buy individual songs from the album online using Ether, a digital currency; as soon as the transaction was recorded, the content owners received their money.

Smart contracts could have a significant impact beyond the media and entertainment industries. In the energy sector, for example, they are being created to manage billing and revenue allocation when consumers charge the batteries of electric cars. The contracts will calculate the amount due, generate invoices, collect the payments using cryptocurrency, and transfer the revenue to the charging station owners. Smart contracts can also be used to simplify settlements between parties in all sorts of areas, including e-commerce and supply chains.

Although the three applications discussed so far may be the most common and versatile, several others address challenges specific to the media and entertainment industries. One is blockchain time-stamping, which allows photographers and other creators of digital artwork to register proof of copyright quickly and inexpensively so that they can protect their creations from unauthorized use on the internet. Time-stamping is a simplified version of smart property. It doesn’t track ownership changes, but it does confirm that the creator owned the asset at a specific point in time. Another application that we refer to as “blockchain content ledger” records digital content information like asset metadata and social media transactions. It is a direct extension of smart property. Indeed, once a blockchain is used to store ownership information, it can also be used to hold additional information about the content. For music, this might include the songwriters, performing artists, publisher, and label. In the case of social media, it might include user posts and related activities such as “upvoting,” “downvoting,” and comments. Because the data is decentralized (not controlled by any single party) and irreversible (once entered and accepted, items can’t be changed unilaterally), it’s both highly secure and accessible to different parties.

### Blockchain-Enabled Business Models

By leveraging the blockchain applications we’ve described, companies are starting to build innovative business models that not only offer new monetization strategies for their digital assets but also streamline critical business activities such as relationships with business partners and distribution of revenue across the value chain. These developments could create completely new ecosystems for content creation and consumption. Among the startups we studied, we saw five business model innovations. The first two have disruption potential; the rest are helping existing players compete more effectively or explore market gaps. (See “Two Classes of Business Model Innovation,” p. 43.)

**Monetizing content for both creators and curators.** The first new business model involves creating a social network in which users can earn financial rewards (in the form of micropayments or payments of digital currency) by posting their own content or curating and promoting others’ posts. Rather than allowing the platform owners to reap all the monetary benefits, as happens today with established players like Facebook and LinkedIn, this model compensates independent content creators (bloggers, experts, hobbyists) and consumers (social network users who enjoy sharing their opinions) for their contributions. For example, Steemit, a blockchain-based social network, rewards content creators with digital currency (called “Steem”) based on the popularity of their posts. Although it was initially geared toward users interested in the...
Building a one-stop content shop. The second new business model simplifies the value chain by decreasing or eliminating the need for intermediaries between users who create content and those who consume it. The model does away with many of the traditional steps and layers, such as content aggregation and distribution, thereby reducing the amount of time it takes to bring new content to consumers and realize revenue. It relies heavily on cryptocurrency and blockchain-based applications like smart contracts and smart property to facilitate and process direct transactions between creators and consumers.

One company that uses this model is SingularDTV, a blockchain film and television studio and distribution portal. SingularDTV caters to video and film producers by giving artists more control over their work, allowing them to launch, distribute, and monetize content without the usual intervention from studios or production houses and without being tied to exclusivity agreements with distribution channels. At the same time, it uses smart contracts to enable consumers to browse, access, and pay for content instantaneously with digital currency.

In a similar vein, startups Creativechain and Musicoin offer their own marketplaces for digital content, where creators and consumers can interact without intermediaries. Creativechain targets artists, including musicians, designers, and writers, using a blockchain designed to support content registration, distribution, and monetization. Artists can choose from different licensing methods, ranging from free distribution to paid limited editions. This flexibility lets them select the method that is best suited to distributing their work. Under this scenario, there is no need for third-party distributors to bring the content to consumers and collect revenue; the platform handles that directly. Musicoin, meanwhile, focuses exclusively on the music industry and encourages independent artists to register and publish their work on its own blockchain-based platform. It uses a standard pay-per-play smart contract to reward musicians based on preset fees each time a song gets played. In addition, consumers are encouraged to reward their favorite artists with tips. Besides distributors, other players typically involved in music rights management (including what are known as “performing rights organizations,” which essentially collect royalties for music performance on behalf of rights owners) are not needed on this platform since it connects music consumers directly to artists or labels and automatically customizes revenue distribution.

The startups adopting this business model are capturing revenue in different ways. Since content is being sold and payment transactions are handled in the platform, one straightforward monetization strategy is to charge commission fees. Other options companies are considering are licensing platforms for use by third parties and creating and selling original content. In addition, some startups are following an open-source model: The platform is published as free software, and the startup works to drive its further development while earning money by providing services like consulting, training, or onboarding. As with the previous business model (monetizing content for both creators and curators), one-stop content shops are still
## Two Classes of Business Model Innovation

Blockchain is driving two classes of business model innovation in the media and entertainment industries: disruptive models, which represent potential threats to leading players, and sustaining models, which allow established companies to strengthen their businesses.

<table>
<thead>
<tr>
<th>BUSINESS MODEL</th>
<th>WHO IT SERVES</th>
<th>WHAT IT PROVIDES</th>
<th>HOW IT USES BLOCKCHAIN</th>
<th>VALUE IT GENERATES FOR THE COMPANY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Disruptive Business Models</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Monetizing content for both creators and curators</strong></td>
<td>Social media users</td>
<td>Monetary incentives for posting and voting A decentralized, censorship-free platform</td>
<td>Blockchain content ledger Micropayments Cryptocurrency</td>
<td>Selling the power to influence Transaction fees, commissions</td>
</tr>
<tr>
<td><strong>Building a one-stop content shop</strong></td>
<td>Digital content creators Digital content consumers</td>
<td>Single place for publishing, distributing, and consuming content Direct transactions between creators and consumers</td>
<td>Smart contracts Smart property Cryptocurrency</td>
<td>Transaction fees, commissions Selling original content Platform licensing Services around the open-source platform</td>
</tr>
<tr>
<td><strong>Sustaining Business Models</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Protecting intellectual property</strong></td>
<td>Digital content creators</td>
<td>Simplified copyright registration and distribution of digital content</td>
<td>Time-stamping Smart property</td>
<td>Transaction fees, commissions</td>
</tr>
<tr>
<td><strong>Digitizing the music value chain</strong></td>
<td>Existing music value chain players</td>
<td>Reduce transaction costs Speed up revenue distribution</td>
<td>Smart contracts Smart property Blockchain content ledger</td>
<td>Services around an open-source platform</td>
</tr>
<tr>
<td><strong>Playing and trading</strong></td>
<td>Mobile gamers</td>
<td>Full off-game ownership of game assets tradeable and sellable with cryptocurrency</td>
<td>Smart property Cryptocurrency</td>
<td>In-game asset sales</td>
</tr>
</tbody>
</table>

experimenting with different revenue model options until the most effective ones consolidate.

Among the blockchain-focused business models we looked at, monetizing content and building a one-stop content shop were the most disruptive. In both instances, companies are starting small by serving a low-end market niche (for example, indie music labels and their audiences) with a value proposition aligned with users’ goals (helping both artists and consumers capture more financial value and making their transactions less cumbersome). Because the underlying blockchain technology is not sufficiently mature to handle billions of users and millions of content titles, startups are not yet able to challenge established mass-market players like Facebook, Amazon Prime, and Netflix. But that’s partly what makes the new models serious threats: Industry leaders might not recognize them as threats in time to protect themselves. As the technology matures and the blockchain-enabled startups begin serving broader segments of customers—with a wider range of content, for instance, or ad-free social media environments—look out.

The other business models we identified are not disruptive innovations. They’re geared more toward solving industry-specific problems, and they either make existing players more competitive or simply address specific market gaps. They include the following:

**Protecting intellectual property.** This business model leverages blockchain smart property and time-stamping applications to help artists affordably protect, share, and manage the rights of their digital...
works. A startup called Binded, for example, allows photographers to register unique images in a blockchain as evidence of copyright ownership. Artists receive a copyright certificate that can be used to prevent unauthorized use of the images on the web. Monegraph offers a service for artists to upload their digital work and sell different levels of usage rights to publishers and advertisers. In addition to using blockchain to store ownership and licensing information on individual works, it also provides a public and independent record of licensing transactions between content owners and distributors. The model attempts to fill a market gap: giving independent artists such as photographers an affordable mechanism for copyright protection. In this business model, startups typically don’t charge artists for registering their works in the blockchain. Instead, they often take a share of the profits their service enables. Monegraph, for example, charges a processing fee on the sales that artists generate on its platform.

**Digitizing the music value chain.** The primary goal of this business model is to optimize the process of distributing music revenue across the various parties in the value chain so that companies can become more agile and reduce their costs. (It usually relies on what’s known as a “permissioned blockchain.”) Optimizing revenue distribution is notoriously difficult, given the large number of stakeholders involved in music creation, the complex relationships between them, and the absence of a shared copyright database. So, music revenue often takes months or even years to find its way to the rightful owners. Unlike the previous models, which mostly address narrow market segments, this one covers a broader universe of customers. For example, Dot Blockchain Media, one of several startups using this model, works with artists, record labels, aggregators, distributors, and performing rights organizations to create a standardized blockchain-driven database for music rights that can be used industrywide. Many parties stand to benefit. For example, distributors, aggregators, and performing rights organizations could use the database to optimize their own processes and reduce internal costs, and rights owners could receive payments faster. The database will be maintained in an open-source fashion by all of the stakeholders. Dot Blockchain Media’s own role is driving the creation of the ecosystem, defining the technology elements and the file and metadata formats, and supporting participants on the usage and evolution of the platform. This will enable it to drive its own revenues from services based on the platform.

**Playing and trading.** This business model allows assets registered in a blockchain to be sold or traded in other environments. One company that is experimenting with this approach is EverdreamSoft, a Swiss game developer. It offers a game in which people buy cards that they use to play. What distinguishes it from other games where players buy assets is that the cards are registered in a public blockchain and can be sold or traded outside the game, through digital currency. A similar approach could be adopted by other gaming companies, with the benefits of making the game assets more valuable and potentially increasing the revenue generated by in-game asset purchases. This might also expand interest in the games themselves, creating a network effect that can lead to increases in game-related revenue streams such as subscriptions or licenses.

**Consequences for Industry Players**

In thinking about how blockchain affects media and entertainment companies, we see both threats and opportunities for industry players. For content creators, blockchain offers significant opportunities. It can provide more control over their work, more flexible license models, a greater share of the content revenue, and faster monetization. These are clear potential benefits, even if they may take time to materialize.

For aggregators, including record labels, publishing companies, performing rights organizations, and others, a reduced role for intermediaries and more efficient distribution of revenue across the chain might make them less relevant and therefore pose a potential threat. But incorporating blockchain-driven technology into existing offerings could help aggregators concentrate on activities where they can add real value (such as discovering and fostering new talent, financing complex projects like movies and TV shows, and providing promotion and marketing muscle). Moreover, as an enabler of sustaining innovation, blockchain could prod aggregators to redefine or reinforce their place in the value chain. In many cases, the role of the aggregator can’t be completely automated and replaced by blockchain smart contracts. Managing contracts,
relationships with labels, legacy catalogs, and even the collection of royalty payments for musical events (concerts, radio, and TV) may still require lots of personal involvement. However, aggregators should be able to leverage permissioned blockchains to handle some processes more efficiently and fill gaps between the digital and analog worlds.

For distributors, there is no escaping the fact that the threat of disruption is real. Ironically, online distributors such as Spotify and Amazon, which have reaped huge profits from the digitization of content, may face some of the biggest risks. As content consumers are able to connect directly with content creators, distributors may play much smaller roles. Even if this change takes many years to materialize, the threat can’t be ignored. Like aggregators, distributors need to figure out what they provide that’s distinctive beyond being an access and payment channel. To prepare for the future, they need to experiment with blockchain-enabled business models so that they can position themselves in a new digital content market built on this technology.

André Dutra is a consultant on digital business solutions at Ericsson in Munich, Germany. Andranik Tumasjan is a professor of management and digital transformation at the University of Mainz in Germany. Isabell M. Welpe is the chair for strategy and organization at Technical University of Munich in Germany. Comment on this article at http://sloanreview.mit.edu/x/60107.

REFERENCES

1. Bitcoin implements what’s known as cryptocurrency, a medium of digital exchange that uses cryptography (advanced mathematical techniques to encode digital information) to secure financial transactions, control the creation of additional units, and verify the transfer of assets. An overview of basic cryptography concepts used in cryptocurrencies can be found in A. Narayanan, J. Bonneau, E. Felten, A. Miller, and S. Goldfeder, “Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction” (Princeton, New Jersey: Princeton University Press, 2016).


7. We used Harvard Business School professor Clayton M. Christensen’s disruptive innovation theory as a reference for assessing how various business models would affect an industry. See C. Christensen, “The Innovator’s Dilemma,” (Cambridge, Massachusetts: Harvard Business School Press, 2016). On the one hand, disruptive innovations successfully challenge established industry players by starting with a fresh business model that is initially overlooked by the incumbents. Sustaining innovations, on the other hand, bring established players competitive advantage by enhancing their existing models. So assessing new business models as either disruptive or sustaining helps companies figure out how to react to the innovations.


9. This service, called Share&Charge, was introduced by the German company Motionwerk.


11. Permissioned blockchains allow only trusted participants, who are identified according to specific criteria. Because they can use simpler consensus mechanisms, permissioned blockchains can scale better than permissionless blockchains. With permissionless blockchains anyone can join the network, and complex consensus mechanisms must be built to maintain the integrity of the ledger. See J. Mattila, “The Blockchain Phenomenon — The Disruptive Potential of Distributed Consensus Architectures,” ETLA Working Papers 38, Research Institute of the Finnish Economy, 2016.

12. It’s interesting to note that Spotify has acquired a blockchain startup and Amazon has begun to offer its own general-purpose blockchain solutions. See S. Perez, “Spotify Acquires Blockchain Startup Mediachain to Solve Music’s Attribution Problem,” TechCrunch, April 26, 2017; and N. Fearn, “Amazon Debuts Blockchain Network Solution,” Internet of Business, April 23, 2018.


Reprint 60107.

Copyright © Massachusetts Institute of Technology, 2018. All rights reserved.
Preparing for a Blockchain Future

MICHAEL FERGUSON

Consider three key questions when determining how to make blockchain a useful part of your business strategy.

Blockchain technology is set to be a major player of the future digital economy, but many business leaders remain unsure what that means for their companies going forward. In a Deloitte survey of 308 senior executives at large U.S. companies, 39% of respondents had little or no knowledge about blockchain technology. A survey of more than 200 board-level, non-IT executives in the U.K. yielded similar results: About 40% said they do not fully understand the technology, and less than 10% believe their organizations have the necessary skill sets to adopt it.

To start by unpacking what blockchain really means, let’s refer to HubSpot’s approachable definition: Blockchain is “a record-keeping technology that is nearly impossible to tamper with. That’s because a blockchain’s records, or ‘ledger,’ is hosted by everyone in the network and openly available to everyone in the network, like a public spreadsheet that they add to but can never edit or delete.”

But where should business leaders go from there? How can they determine best practices for utilizing the decentralized web and make blockchain technology a useful part of their business strategy? My organization has found it useful to focus on the following three questions. These offer particular benefits for platform businesses, which will need to address weakening network effects as they lose ownership of participants’ data.

1. **What value will we offer?** This first question gets at the paradigm shift the decentralized web presents. The advent of blockchain isn’t just about new ways of operating. It forces many businesses — platforms in particular — to take a fresh look at why they exist.
Consider, for example, eBay, Uber, and Airbnb. Throughout the era of TCP/IP (the web protocol that computers use to talk to each other), these platforms have acted largely as centralized repositories of information. You want to buy a product, they know who has it for sale. You need a ride, they know who can give you one. You need a place to stay, they know who has an extra bedroom to rent.

But as blockchains become more common, this kind of information will become publicly available and searchable. You won’t need a centralized authority to show you who has the waffle maker you’re looking for; you’ll be able to see a verified record of who is selling the waffle maker you want at a price you’re willing to pay and who has a track record demonstrating trustworthiness in such exchanges.

To stay relevant, companies will need to provide value in new ways. This requires creative thinking. In the case of my startup Rainmakers, our current business model focuses on placing sales professionals with leading technology companies. However, people will soon own and fully control the data that they now make available and view on our platform. Hiring managers will be able to find candidates with the right skills, experiences, and recommendations to meet their needs — without our help.

So, we’re investigating other ways to make hiring managers’ lives easier. These offerings include phone screening, validation of candidate data, and onboarding support. We’re also exploring how we might help candidates make themselves more attractive to employers. We’re rethinking our business model because blockchain could render the old one obsolete. This kind of strategic foresight and ability to sense and pivot will be crucial for organizations trying to compete in a blockchain-enabled world.

2. How public will our blockchains be? The next step is to decide whether to invite everyone into the blockchain network or create a more limited system just for verified participants. This, too, is a strategic question. It involves weighing the advantages and risks of an “open source” approach.

My team could end up doing both. For instance, we might build a public network where candidates can share much of the information that employers are looking for and also set up a private one with paid access to more granular data about individuals’ work experience and sales records. For everyone in the private blockchain — candidates and companies alike — all public and private information would be funneled through one integrated profile, simplifying the user experience.

Having a robust and growing public blockchain would draw all the right players to our business, including job seekers, hiring managers, and other staffing companies. And the bigger our public blockchain becomes, we’re betting, the more companies will want to pay for access to the private one.

3. What incentives will we offer to participate? We recognize that we won’t suddenly have millions of
individual job seekers and staffing companies creating profiles on our blockchain. We’ll need to draw them in by first attracting a critical mass of hiring companies to the platform early on — which means providing immediate value to those partners.

Even if the number of candidates on our private blockchain is small at first, we’ll be working to gather information from them that isn’t available elsewhere — this kind of information will help companies make the right hires, as we’ve seen over the years placing salespeople into different organizations. Likewise, other businesses could follow a similar model, capitalizing on their expertise in their respective industries while moving to a blockchain strategy.

For example, businesses might offer crypto tokens, or blockchain assets, as additional incentives for participation. (For a helpful primer on tokens, see “Some Simple Economics of the Blockchain,” a working paper by Christian Catalini of MIT Sloan School of Management and Joshua Gans of the Rotman School of Management.) We’re considering how we might use tokens as incentives at Rainmakers. We could allow job candidates to earn them for keeping their résumés updated, for example, and cash them in for enhanced visibility on our platform, the chance to apply for certain positions, or services such as training and assessment. Employers who use our site could earn them by validating employees’ data and spend them on vetting and onboarding services. We could allow third parties to provide services on our platform and earn tokens, as well.

To Innovate, Be Willing to Evolve

Of course, our strategy will most likely evolve as we see how blockchain technology is adopted in our industry and as our own implementation presents new challenges and opportunities. That will be the case for every business. It’s important to revisit these three questions and continually assess and adjust the business model.

Blockchain and the decentralized web aren’t just hype. They’re what lie ahead. According to the Deloitte survey, 21% of senior executives who are informed about blockchain indicated that their company has already brought the technology into production, while 25% plan to do so within the next year.

Businesses that don’t sort out their blockchain strategy soon risk being disrupted by competitors and, worse, watching their entire business models go obsolete.

About the Author

Michael Ferguson is the CEO of Rainmakers. He previously founded two other startups and holds an MBA from University of Oxford’s Saïd Business School.
Articles published in MIT Sloan Management Review are copyrighted by the Massachusetts Institute of Technology unless otherwise specified at the end of an article.

MIT Sloan Management Review articles, permissions, and back issues can be purchased on our Web site: sloanreview.mit.edu or you may order through our Business Service Center (9 a.m.-5 p.m. ET) at the phone numbers listed below. Paper reprints are available in quantities of 250 or more.

To reproduce or transmit one or more MIT Sloan Management Review articles by electronic or mechanical means (including photocopying or archiving in any information storage or retrieval system) requires written permission.

To request permission, use our Web site: sloanreview.mit.edu or E-mail: smr-help@mit.edu
Call (US and International):617-253-7170 Fax: 617-258-9739

Posting of full-text SMR articles on publicly accessible Internet sites is prohibited. To obtain permission to post articles on secure and/or password-protected intranet sites, e-mail your request to smr-help@mit.edu.